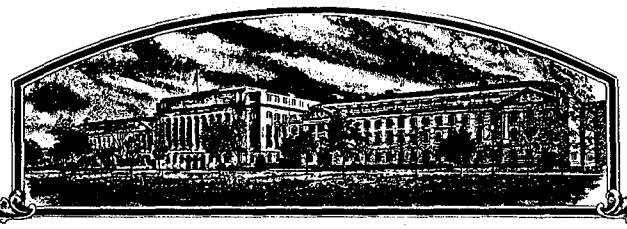

No. 9000123

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Holden's Foundation Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'LH162'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 29th *day of* March *in the year of our Lord one thousand nine hundred and* ninety-one.

Attest:

Kenneth J. Evans

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Ed Madigan

Secretary of Agriculture

FORM APPROVED: OMB 0581 0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Holden's Foundation Seeds, Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.
Ex1608

3. VARIETY NAME
LH162

4. ADDRESS *(street and no. or R.F.D. no., city, state, and ZIP)*
201 N. Maplewood Avenue
P.O. Box 839
Williamsburg, Iowa 52361

5. PHONE *(Include area code)*
319-668-1100

FOR OFFICIAL USE ONLY

PVPO NUMBER
9000123

FILING
Date: March 23, 1990
Time: ☐ A.M. ☐ P.M.

FEES RECEIVED
Filing and Examination Fee: $ 2150.—
Date: Mar. 23, 1990
Certificate Fee: $ 250.—
Date: Feb. 19, 1991

6. GENUS AND SPECIES NAME
Zea mays

7. FAMILY NAME *(Botanical)*
Gramineae

8. CROP KIND NAME *(Common Name)*
Corn, Field

9. DATE OF DETERMINATION
November 1989

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

12. DATE OF INCORPORATION
1968

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Mr. Mark Armstrong
P.O. Box 839
Williamsburg, Iowa 52361

PHONE *(Include area code)*: 319-668-1100

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow INSTRUCTIONS on reverse)*

a. ☒ Exhibit A, Origin and Breeding History of the Variety.
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety.
d. ☒ Exhibit D, Additional Description of Variety.
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.
f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office 3/21/90
g. ☒ Filing and Examination Fee ($2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See section 83(a) of the Plant Variety Protection Act.)*
☐ YES *(If "YES," answer items 16 and 17 below)* ☒ NO *(If "NO," skip to item 18 below)*

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES *(If "YES," through* ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____ .)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE
Arnold Holden	President	3/21/90
SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE

1

Origin and Breeding History of the Inbred

Exhibit A

LH162 was developed from a cross ND246 x Early Mo17 Pollen Composite. The seed from this cross was selfed and the pedigree system of plant breeding was used to develop LH162. ND246 is a public corn inbred line developed and released by North Dakota State University. The Early Mo17 Composite is a population of early maturing Mo17 type plants developed by and the property of Holden's Foundation Seeds, Inc. The earliest maturing plants were selected from the Early Mo17 Composite population and a bulk pollen sample was gathered and used to cross to ND246. On the following pages are a summary and description of the development of LH162. Also included are copies of pages from Holden's Foundation Seeds, Inc. nursery books. The rows associated with the development of LH162 have been highlighted.

Attached is a statement from the originating plant breeder, Scott Bergemann, Holden's Foundation Seeds, Inc., stating that the line, LH62, is stable, uniform and free of variance within the population.

Origin and Breeding History of the Inbred
LH162 = Ex1608 = ND246 x Early Mo17

Exhibit A

Row/Field	Pedigree	Location	Year
Home Field	LH162	Iowa	1989
West Elwood Garden	LH162	Iowa	1989
Home Field	LH162	Iowa	1988
2879-2898	LH162	Minnesota	1988
201-210	Ex1608	Minnesota	1987
585	ND246 x Early Mo17	Minnesota	1986
14947	ND246 x Early Mo17	Hawaii	1985-86
8218	ND246 x Early Mo17	Minnesota	1985
21411	ND246 x Early Mo17	Hawaii	1984-85
5566	ND246 x Early Mo17	Minnesota	1984
7017	ND246 x Early Mo17	Hawaii	1983-84
5583	ND246 x Early Mo17	Minnesota	1983
1-469	Early Mo17 Composite	Iowa	1982
15391	ND246	Iowa	1982

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Uniformity Statement

Exhibit A

I have observed LH162 for the past three generations it has been increased, 1987 Minnesota nursery rows 201-210, 1988 Minnesota nursery rows 2879-2898, 1988 Iowa production Home Field and 1989 Iowa production Home Field and West Elwood Garden Field. In each of these increases, seeds from the previous generation were planted. The line is very stable and uniform. LH162 is also free of variance from within the population.

Scott Bergemann

Scott Bergemann
Plant Breeder

Novelty Statement

Exhibit B

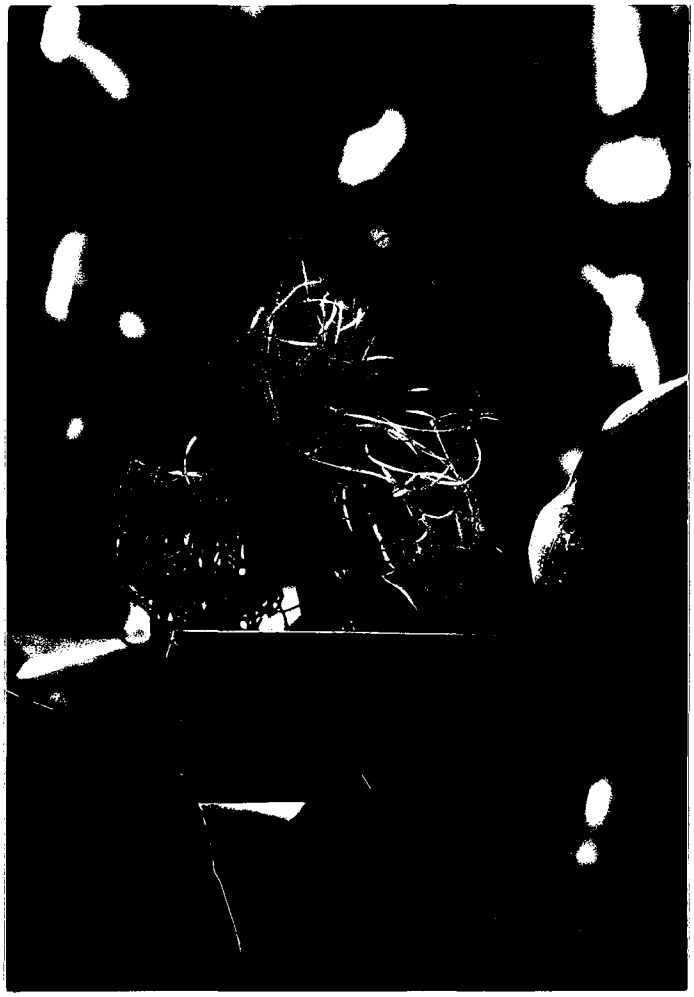
LH162 most closely resembles the corn inbred line ND246, however, the tassel branches of LH162 are more erect than the tassel branches of ND246. The tassel branches of ND246 are not erect and tend to droop or "flatten out". Photographs of both inbred tassels are attached showing this difference.

The silk color of LH162 is salmon, while the silk color of ND246 is green. A photograph of the exposed silks of LH162 is attached.

LH162 has a pink cob color, whereas the cob of ND246 is red.

Exhibit B (continued)

Silk color of LH162



FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-28
(2-15-74)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C
(Corn)

OBJECTIVE DESCRIPTION OF VARIETY

CORN *(ZEA MAYS)*

NAME OF APPLICANT(S)

Holden's Foundation Seeds, Inc.

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*

201 N. Maplewood Avenue
P.O. Box 839
Williamsburg, Iowa 52361

FOR OFFICIAL USE ONLY

PVPO NUMBER
9000123

VARIETY NAME OR TEMPORARY DESIGNATION

LH162

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. TYPE:

[2&3] 1 = SWEET 2 = DENT 3 = FLINT 4 = FLOUR 5 = POP 6 = ORNA. ,ENTAL

2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

[2] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST
5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability):

(Under "comments" (pg. 3) state how heat units were calculated)

[7][1]	DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK	[1][2][2][1] HEAT UNITS
[0][0]	DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY	[0][0][0][0] HEAT UNITS
[0][0]	DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE	[0][0][0][0] HEAT UNITS

4. PLANT:

[1][7][1] CM. HEIGHT (To tassel tip)

[0][8][5] CM. EAR HEIGHT (To base of top ear)

[1][1] CM. LENGTH OF TOP EAR INTERNODE

Number of Tillers:

[1] 1 = NONE 2 = 1–2 3 = 2–3 4 = > 3

Number of Ears Per Stalk:

[2] 1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY
3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

Cytoplasm Type:

[1] 1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = OTHER (Specify) _____

5. LEAF (Field Corn Inbred Examples Given):

Color: 5GY 4/6 Munsell Color Charts for Plant Tissues

[ ] 1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DARK GREEN (B14) 4 = VERY DARK GREEN (K166)

Angle from Stalk (Upper half):

[2] 1 = < 30° 2 = 30–60° 3 = > 60°

Sheath Pubscence:

[2] 1 = LIGHT (W22) 2 = MEDIUM (WF9)
3 = HEAVY (OH26)

Marginal Waves:

[2] 1 = NONE (HY) 2 = FEW (WF9) 3 = MANY (OH7L)

Longitudinal Creases:

[2] 1 = ABSENT (OH51) 2 = FEW (OH56A)
3 = MANY (PA11)

Width:

[0][8] CM. WIDEST POINT OF EAR NODE LEAF

Length:

[0][7][1] CM. EAR NODE LEAF

[1][1] NUMBER OF LEAVES PER MATURE PLANT

9000123

6. TASSEL:

[1][1] NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

[2] 1 = < 30° 2 = 30–40° 3 = > 45°

Pendunce Length:

[0][4] CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

[2] 1 = LIGHT (WF9) 2 = MEDIUM 3 = HEAVY(KY21)

[1*] Anther Color: 1 = YELLOW 2 = PINK 3 = RED 4 = PURPLE 5 = GREEN

*bleaching tan

[6] Glume Color: 6 = OTHER (Specify) green with brown margin

Pollen Restoration for Cytoplasms (o = Not Tested, 1 = Partial, 2 = Good)

[0] "T" [0] "S" [0] "C" [0] OTHER (Specify Cytoplasm and degrees of restoration) _____

7. EAR (Husked Ear Data Except When Stated Otherwise):

[1][6] CM LENGTH [4][0] MM. MID-POINT DIAMETER [9][0] GM. WEIGHT

Kernel Rows:

[2] 1 = INDISTINCT 2 = DISTINCT [1][4] NUMBER

[1] 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = SPIRAL

Silk Color (Exposed at Silking Stage):

[3] 1 = GREEN 2 = PINK 3 = SALMON 4 = RED

Husk Color:

[1] FRESH

[6] DRY

1 = LIGHT GREEN 2 = DARK GREEN 3 = PINK 4 = RED 5 = PURPLE 6 = BUFF

Husk Extention: (Harvest Stage)

[2] 1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear) 3 = LONG (8–10CM Beyond Ear Tip) 4 = VERY LONG (> 10 CM)

Husk Leaf:

[1] 1 = SHORT (< 8 CM) 2 = MEDIUM (8–15 CM) 3 = LONG (> 15 CM)

Shank:

[1][4] CM LONG [7] NO. OF INTERNODES

Position at Dry Husk Stage:

[1] 1 = UPRIGHT 2 = HORIZONTAL 3 = PENDENT

Taper:

[2] 1 = SLIGHT 2 = AVERAGE 3 = EXTREME

Drying Time (Unhusked Ear):

[2] 1 = SLOW 2 = AVERAGE 3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

[1][1] MM LONG [0][8] MM. WIDE [0][4] MM. THICK

Shape Grade (% Rounds)

[4] 1 = < 20 2 = 20–40 3 = 40–60 4 = 60–80 5 = > 80

8. KERNEL (Dried) :

[1] Pericarp Color: 1 = COLORLESS 2 = RED-WHITE CROWN 3 = TAN 4 = BRONZE 5 = BROWN 6 = LIGHT RED 7 = CHERRY RED 8 = VARIEGATED (Describe) _____

[1] Aleurone Color: 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) _____

[1] 1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED 7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) _____

[3] Endosperm Color: 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

Endosperm Type:

[3] 1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH 5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) _____

[2][0] GM. WEIGHT /100 SEEDS (Unsized Sample)

9. COB:

[2][9] MM. DIAMETER AT MID-POINT

Strength:

[2] 1 = WEAK 2 = STRONG

Color:

[2] 1 = WHITE 2 = PINK 3 = RED 4 = BROWN 5 = VARIEGATED 6 OTHER (Specify) _____

10. DISEASE RESISTANCE (O = Not Tested, 1 = Susceptible, 2 = Resistant):

[0] STALK ROT (Diplodia)	[0] STALK ROT (Fusarium)	[0] STALK ROT (Gibberella)
[0] NORTHERN LEAF BLIGHT	[0] SOUTHERN LEAF BLIGHT	[0] SMUT
[0] SOUTHERN RUST	[0] CORN SMUT	[0] BACTERIAL WILT
[0] BACTERIAL LEAF BLIGHT	[0] MAIZE DWARF MOSAIC	[0] STUNT
[0] OTHER (Specify)		

11. INSECT RESISTANCT (O = Not Tested, 1 = Susceptible, 2 = Resistant):

[0] CORNBORER	[0] EARWORM	[0] SAPBEETLE	[0] APHID
[0] ROOTWORM (Northern)	[0] ROOTWORM (Western)		
[0] ROOTWORM (Southern)	[0] OTHER (Specify) _____		

12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity	CM105	Kernel Type	ND246
Plant Type	ND246	Quality (Edible)	
Ear Type	ND246	Usage	ND246

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize.Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 — A System for the Classification of Corn Inbred Lines — PhD. Thesis, Ohio State University.

COMMENTS:

$$GDD = \frac{Tmax + Tmin}{2} - 50°F$$

$Tmax \leq 86°F$

$Tmin \geq 50°F$

Additional Description of the Inbred

Exhibit D

LH162 is taller in plant height and ear height than ND246. Measurements taken during the growing season of 1989 at Williamsburg, Iowa, showed LH162 had an average plant height of 171 centimeters and an average ear height of 85 centimeters. ND246 had an average plant height of 163 centimeters and an average ear height of 69 centimeters.

The silk color of LH162 is salmon, while the silk color of ND246 is green.

The ears of LH162 and ND246 are similar in length, however the diameter of the LH162 ear is greater than the diameter of the ND246 ear (40 cm vs. 35 cm). This difference is due to the greater kernel depth or greater kernel length of LH162. A kernel of LH162 measured at the mid-point of the ear measures 11 mm long, 4 mm thick and 8 mm wide. A kernel of ND246 measured at the mid-point of the ear measures 9 mm long, 4 mm thick and 7 mm wide.

LH162 has a pink cob color, whereas the cob color of ND246 is red.

LH162 performs best when crossed to early B14 lines. In these hybrids, LH162 contributes early flowering, early maturity and good standability. LH162 appears to be a good pollinator and an average female.

9000123

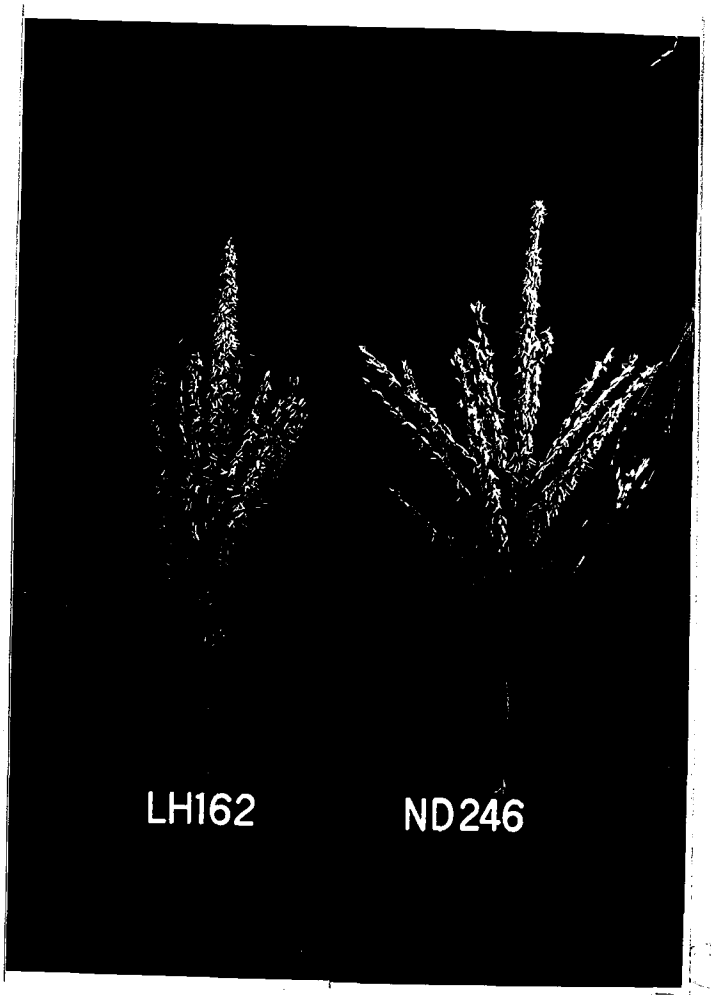
~~Novelty Statement~~

JMS
1/11/91

Exhibit ~~B~~ D addendum

LH162 most closely resembles the corn inbred line ND246, however, the most distinguishing characteristic is the tassel. The tassel of LH162 has a more closed or upright tassel branch angle (~~less than 30°~~ 30-20°), while the tassel of ND246 is more open and not as upright (30°-40°). The photograph of the two tassels below illustrates this characteristic.

JMS
1/11/91



11

Exhibit E

STATEMENT OF THE BASIS OF APPLICANT OWNERSHIP

Holden's Foundation Seeds, Inc., Williamsburg, Iowa, is the sole owner and breeder of the LH162 corn inbred line for which it solicits a certificate of protection.